

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
28 July 2005 (28.07.2005)

PCT

(10) International Publication Number
WO 2005/069081 A3

(51) International Patent Classification⁷: **G03F 7/20**,
G02B 27/28, 5/30

DEGUENTHER, Markus [DE/DE]; Liebigstrasse 2,
73432 Aalen (DE).

(21) International Application Number:
PCT/EP2005/000320

(74) Agent: **MÜLLER-RISSMANN, Werner**; Carl Zeiss AG,
Patentabteilung, Carl-Zeiss-Str. 22, 73447 Oberkochen
(DE).

(22) International Filing Date: 14 January 2005 (14.01.2005)

(25) Filing Language: English

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ,
TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA,
ZM, ZW.

(26) Publication Language: English

(30) Priority Data:
60/537,327 16 January 2004 (16.01.2004) US

(71) Applicant (for all designated States except US): **CARL
ZEISS SMT AG** [DE/DE]; Carl-Zeiss-Strasse 22, 73447
Oberkochen (DE).

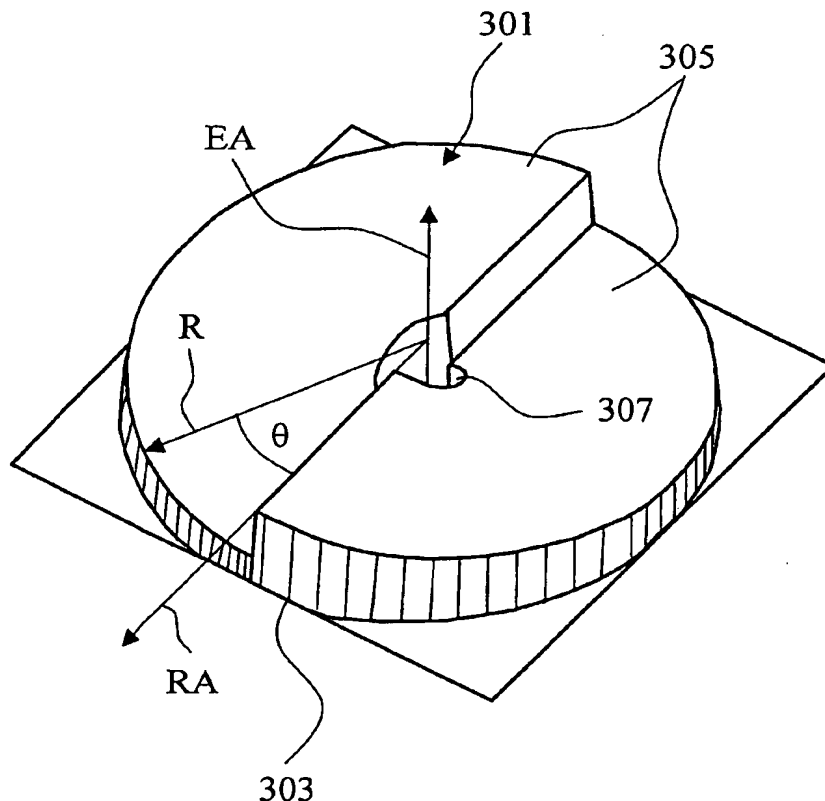
(72) Inventors; and

(75) Inventors/Applicants (for US only): **FIOLKA, Damian**
[DE/DE]; Heckenrosenweg 36, 73446 Oberkochen (DE).

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: POLARIZATION-MODULATING OPTICAL ELEMENT



(57) Abstract: A polarization-modulating optical element (1) consisting of an optically active crystal material has a thickness profile where the thickness, as measured in the direction of the optical axis, varies over the area of the optical element. The polarization-modulating optical element (1) has the effect that the plane of oscillation of a first linearly polarized light ray and the plane of oscillation of a second linearly polarized light ray are rotated, respectively, by a first angle of rotation and a second angle of rotation, with the first angle of rotation and the second angle of rotation being different from each other.



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

Declaration under Rule 4.17:

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

— *with international search report*

(88) Date of publication of the international search report:
10 November 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.